SPECTROSCOPIA MOLECULAR

UN PERIODICO DE NOVAS E INFORMATIONES DE INTERESSE E VALOR AL SPECTROSCOPISTAS

Publicate in interlingua per Forrest F. Cleveland, Professor de Physica, Instituto Technologic de Illinois, Chicago 16. Consiliero linguistic, Dr. A. Gode, Division de Interlingua, Science Service, 80 East 11th St., New York 3. 12 numeros per anno, $2.25. Le periodico depende de receptas financiari ab illes qui beneficia de illo.

Volumine 7 | Martio 1958 | Numero 71

CONFERENTIA SUPER SPECTROSCOPIA MOLECULAR ES TENITE IN LONDON

UN CONFERENTIA super le spectroscopia molecular, organisate per le section de spectroscopia del Gruppo pro Recerca de Hydrocarburo del britannic Instituto de Petroleo, esseva tenite le 27 e 28 de februario al Instituto de Ingenieros Electric in London.

21 Discursos Esseva Presentate

Vinti-un discursos esseva presentate. De istos, tres tractava le resonantia magnetic nucleari, tres le intensitates de bandas, duo le effectos de solvente, duo le fortias intermolecular, e le resto themas miscellanee. Titulos e autores esseva le sequente:

- Le practica e application del resonantia magnetic nucleari. R. E. RICHARDS, Collegio Lincoln, Oxford.
- Un nove methodo pro analysar le spectros de resonantia magnetic nucleari a alte resolution. H. PRIMAS, Zürich, Switza.
- Le resonantia magnetic nucleari in le recerca analytic de petroleo. R. B. WILLIAMS, Compania Humble Oil, Texas, Statos Unite de America.
- Le spectros molecular e le potentiales de ionisation. W. C. PRICE, Collegio King's London.
- Le tubo de choc como un origine de lumine pro studios del spectros de emission e absorption. A. G. GAYDON e J. G. CLOUSTON.
- Le studio systematic del effectos del substituentes alkylic super le spectros ultraviolette e infrarubie de biphenylos. G. H. BEAVEN, Instituto National pro Recerca Medical, Mill Hill, London.

O-O-O-O-O-O-O-O-O-O-O-O-O-

GEMMA DE SAGESSA

TROPPO de institutiones nobile veni sub le conducta de homines minus grande, del conservatores, del administratores qui cognosce lo que occurreva heri sed non pote imaginar lo que poterea occurrer deman. Propulsion es perdite sub tal homines, regulas deveni ossificate, e le passato es deificate -- etiam durante que nos es projectate in un futuro incognite.

-- BROCHURE DEL UNIVERSITATE CHICAGO.

. . . CONFERENTIA IN LONDON . . . . .

• Avantias recente in le instrumentation infrarubie. S. S. D. ORR, Perkin-Elmer A. G., London.
• Differentiation multiple como un methodo pro facer bandas minus large. A. E. MARTIN, Sir Howard Grubb Parsons and Co. Ltd., Newcastle-upon-Tyne.
• Le uso del spectroscopia derivative pro determinar le gruppos methylic in polytheno. G. L. COLLIER e A. C. M. PANTING, ICI Alkali Division. Northwich, Cheshire.
• Le spectroscopia de differentia in le infrarubio proxime. R. G. J. MILLER e H. A. WILLIS, ICI Plastics Division Ltd., Welwyn Garden City, Herts.
• Discussion super le inseniamento de spectroscopistas e le organisation de servicios spectroscopic in un laboratorio industrial.
• Intensitates de bandas vibrational e factores structural molecular. H. W. THOMPSON, Collegio St. John's, Oxford.
• Mesurationes de intensitate del banda de tender asymmetric de moleculas triatomic linear in solutiones. S. CALIFANO, Instituto de Chimia, Universitate Neapole.
• Considerationes theoric in re le intensitates de bandas vibrational. C. A. COULSON, Instituto Mathematic, Universitate Oxford.
• Le influentia del solvente super le spectros infrarubie del alkylbenzenas. C. LA LAU, Koninklijke/Shell-Laboratorium, Amsterdam.
• Effectos de solvente super le frequentias de gruppo. L. J. BELLAMY, Ministry of Supply, Waltham Abbey, Essex.
• Un studio spectroscopic del fortias intermolecular inter moleculas in mixturas gasose. B. VODAR, Centro National del Recerca Scientific, Francia.
• Spectros infrarubie de gases comprimite. J. A. KETELAAR, Universitate Amsterdam.
• Le studio de moleculas adsorbite per le spectroscopia infrarubie. N. SHEPPARD, Universitate Cambridge.
• Progresso recente in le spectroscopia de radicales libere. G. PORTER, Universitate Sheffield.
• Applicationes del radiation infrarubie. G. R. WILKINSON, Collegio King's, London.

Scriptos Disponibile in Avantia

Le scriptos esseva imprimite ante le conferentia e cata un del registrantes recipeva un collection complete de istos duo septimanas ante le assemblea. A cata autor esseva permittite usque a 20 minutas pro summarisar su scripto. Isto esseva sequite per un discussion general.

Reception e Dinar Esseva Arrangiate

Al prime die, il habeva un reception informal con dinar de buffet pro facilitar le cognoscentia del participantes.

In le vespere del secunde die, il habeva un dinar informal. Isto, tanto como le reception, esseva tenite al Hotel Rembrant.

Scriptos Va Esser Publicate

Le scriptos va esser publicate tosto post le conferentia per le Pressa Pergamon in le forma de un libro. (Le adresse del Pressa Pergamon es 122 E. 55th St., New York 22; o 4 Fitzroy Square, London, W. 1; o 24 Rue des Ecoles, Paris Ve.) δ

-•-

JEROME M. DOWLING parlava le 17 de decembre al colloquio de physica al Instituto Technologic de Illinois super recerca al Consilio National de Recerca a Ottawa in Canada.

-•-

JOHN R. PLATT parlava le mesme die al seminario de physica chimic del Universitate Chicago super le spectros de moleculas con catenas conjugate. Formulas quantitative pote esser derivate pro λ e le intensitates.

SPECTROS MICROUNDIC de CH_2N_2, $CHDN_2$, e CD_2N_2

LE SPECTROS rotational del tres isotopos de diazomethano ha essite obtenite per A. P. Cox, L. F. Thomas, e J. Sheridan (Departimento de Chimia, Universitate Birmingham, Anglaterra) in le region 19-90 GHz (G = giga = 10^9; Hz = hertz = c/s).

Le constantes rotational deducite ex iste spectros es in MHz:

Molecula	(B_o+C_o)	(B_o-C_o)	D_{JK}	D_J
CH_2N_2	22150,7 ±0,2	460,2 ±0,2	0,39 ±0,01	<0,01
$CHDN_2$	20640,7 ± 0,2	578,3 ± 0,2	0,27 ±0,01	<0,01
CD_2N_2	19389,0 ± 0,2	696,2 ± 0,2	ca. 0,2	-

Un valor preliminari de 1,45 D esseva obtenite pro le momento de dipolo ex mesurationes del effecto Stark pro le transition $0_{00} \rightarrow 1_{01}$. Le structura fin de quadrupolo nucleari esseva resolvite, sed su analyse ha nondum essite completate.

Le momento de inertia I_A es 3,15 x 10^{-40} g cm^2. Le resultatos es consistente con le structura planar de symmetria C_{2v}, como esseva indicate previemente per le spectros infrarubie.

Le parametros structural del molecula, ignorante alicun defecto quantic e le effectos del energias del puncto zero super le distantias internucleari, esseva:

C-H = 1,08 Å, H-C-H = 127°,
C-N = 1,32 Å N-N = 1,12 Å,
C-N + N-N = 2,442 ± 0,005 Å.

Nulle spectros attribuibile a un forma tautomeric de diazomethano esseva detegite. Plus detalios va esser publicate in Nature. ♁

LE ORDINE DEL ATOMOS in un MOLECULA LINEAR

LE CONSTANTES de fortia (o constantes del energia potential) obtenite ex le spectros Raman o infrarubie de un numero sufficiente de species isotope pote esser usate pro determinar le arrangiamento correcte del atomos in un molecula linear, secundo E. Bright Wilson Jr. del Universitate Harvard a Cambridge in Massachusetts.

Le methodo convenibile proponite per Dr. Wilson pro le calculation del constantes de fortia usa como coordinatas omne le distantias internucleari, etiam si un ligamine chimic non existe inter le duo atomos. Un matrice diagonal del constantes de fortia, quando iste coordinatas es usate, ha le numero correcte de elementos independente. Usate es le facto que le matrice G ha le mesme forma si o non le coordinatas es independente.

Ex observationes experimental del vibrationes de tender de un numero sufficiente de formas isotope del molecula, le constantes de fortia es determinate. Le numero de iste constantes es $N(N-1)/2$, ubi N es le numero de atomos in le molecula. Le constantes que corresponde a ligamines chimic es plus grande que illos que corresponde a distantias non ligate. Assi, on ha le informationes necessari pro determinar le ordine del atomos in le molecula.

Exemplo

Per exemplo, H-C-N ha le distantias r_{hc}, r_{cn}, e r_{nh}. Datos experimental existe pro le isotopos $HC^{12}N^{14}$, $DC^{12}N^{14}$, e $DC^{13}N^{14}$. Consequentemente, il ha 3 equationes pro le 3 constantes incognite. Ex istos, on obtene f_{ch} = 6,1, f_{cn} = 19,4, e f_{nh} = 0,5 mdyn/Å. Assi, H e C, e C e N es ligate, sed N e H non es ligate. ♁

LE REPORTOS DE MIGEOTTE SUPER LE INFRARUBIO

MARCEL V. MIGEOTTE del Universitate Liege ha preparate un atlas del spectro solar ab 2,8 a 24 μ como observate al Jungfraujoch in Switza. Plus recentemente, ille ha preparate un secunde reporto. Isto es un tabula de identificationes pro accompaniar le atlas. Ille nunc prepara un tertie reporto que va continer spectros laboratorial, con identificationes quando possibile, del bandas de absorption de CH_4, O_3, N_2O, CO, H_2O, e CO_2. Le mesme spectrometro usate pro le obtention del spectro solar es empleate pro iste compositos.

Le Reportos Es Disponibile

Un numero limitate del tres reportos es disponibile ab John N. Howard, Air Force Cambridge Research Center, Laurence G. Hanscom Field, Bedford, Mass., S. U. A.

Le titulos proprie del reportos es:

1) Reporto final, phase A, parte I;
2) Reporto final, phase A, parte II;
3) Reporto final, phase B.

Scriptores debe mentionar le codice CRZCI. ♁

ARTICULOS SUPER SPECTROS MOLECULAR IN SPECTROCHIMICA ACTA

ARTICULOS DE interesse al spectroscopistas molecular in Spectrochimica Acta, Vol. 10, No. 3, Jan. 1958 es:

- Le spectro infrarubie de alicun compositos de chelato metallic, I. RUBEANATOS.
- Le spectros de absorption ultraviolette de amino-1,2,3-triazoles phenylic substituite, E. LIEBER, C. N. R. RAO, e T. S. CHAO.
- Contribution al spectrometria Raman. II. Intensitate del linea de carbonylo aliphatic. G. MICHEL e G. DUYCKAERTS.
- Studios spectroscopic del compositos de terra rar. I. Instrumentation. P. KRUMHOLZ.
- Studios spectroscopic del compositos de terra rar. II. Un studio comparative del spectros de absorption del ion de neodymium in un solution aquee e in sales crystallin. P. KRUMHOLZ.
- Spectros a temperatura dependente de calcite a resolution grande. R. M. HEXTER.
- Investigation spectroscopic infrarubie del disordine rotational de anion in le nitrato de natrium. R. M. HEXTER.
- Spectros infrarubie del cyanidos de silylo e silylo-d_3. H. R. LINTON e E. R. NIXON.
- Le spectros vibrational e le structura de ferrocena e ruthenocena. E. R. LIPPINCOTT e R. D. NELSON.

Etiam includite essera contos de un symposio super le spectroscopia applicate e de un conferentia super le applicationes industrial del analyse per uso del radios X. ♁

UN CELLA INFRARUBIE PRO PRESSIONES GRANDE

UN CELLA INFRARUBIE disponibile ab le Corporation Perkin-Elmer (Norwalk, Conn., S.U.A.; Depto. S856) pote esser usate usque a un pression de 15 kg/cm^2. Le cella ha un corpore de aciero non-corrosive e fenestras de KBr, NaCl, KF, o quarz fundite attachate con annulos O de "Kel-F". Le longitudes del cellas es 60 mm, o variabile ab 5 a 10 mm.

-•-

LE CORPORATION Perkin-Elmer nunc ha un bureau de venditas in London.

CONSTANTES DEL ENERGIA POTENTIAL PRO DEUTERIOSILANOS

CONSTANTES DEL energia potential ha essite calculate per I. F. Kovalev (Instituto Pedagogic Saratov) ex le spectros Raman pro SiH_4, SiH_2D_2, $SiHD_3$, e SiD_4. Le constantes pro SiH_4, obtenite per le methodo de quadratos minimal, esseva k_q = 4,630 ± 0,006, a = 0,170 ± 0,66, h = 0,053 ± 0,004, l = 0,038 ± 0,005, e k_δ = 0,390 ± 0,009 in unitates de $10^6/cm^2$. Le errores in le constantes, trovate per le methodo de Mayants, esseva 0,13, 7, 2, 39, e 13 per cento pro k_q, h, k_δ, a, e l, respectivemente.

Proque Tindal e al., e Meal e Wilson, non considerava le effecto anharmonic, lor constantes pro SiH_4 es incorrecte e non concorda con le resultatos experimental. Le deviation medie de Kovalev esseva minus que 2 K, illo de Meal e Wilson esseva 17 K (K = kayser = unda/cm).

Iste resultatos esseva reportate in Optika i Spektroskopiya 2 (1957) 310-16, Un traduction in anglese del articulo pote esser obtenite; vide Spec. Mol. 6 (1957) 46. ♁

STRUCTURA ELECTRONIC DE O_3

INGA FISCHER-HJALMARS del Instituto de Physica Theoric del Universitate Stockholm in Sveda ha facite un investigation theoric del structura electronic de O_3 per le methodo de orbitales molecular, basate super combinationes linear de orbitales atomic que es internemente consistente.

Le energia de dissociation, le momento de dipolo del stato normal, e le transitiones al nivellos le plus basse ha essite computate. Le momento de dipolo assi obtenite ha le signo expectate e es quasi correcte in magnitude. Le transitiones electronic computate ha essite assignate tentativemente al bandas de absorption observate.

Un reporto detaliate de iste labor ha essite submittite pro publication in Ark. Fys. ♁

ASSEMBLEA GENERAL DEL UIPPA

LE UNION INTERNATIONAL de Physica Pur e Applicate, fundate in 1922, teneva su 9ne assemblea general a Roma in Italia ab le 17 al 20 de septembre 1957. Le committees national del USSR, Austria, e Bulgaria esseva admittite formalmente al Union. Le numero del paises que nunc adhere al Union es 30.

Pro le intervallo 1957 a 1960, le Committee Executive del Union va haber le membros sequente: presidente, E. Amaldi (Roma); presidentes passate, N. F. Mott (Cambridge, Anglaterra) e M. Siegbahn (Stockholm); vicepresidentes, J. de Boer (Amsterdam), R. B. Brode (Berkeley), M. Kotani (Tokio), J. H. Van Vleck (Cambridge, Massachusetts), G. Herzberg (Ottawa), A. Joffe (Leningrad), E. Rasmussen Copenhagen), H. Staub (Zürich), F. C. A. Trendelenburg (Erlangen), e J. Weyssenhoff (Cracovia); secretario general, P. Fleury (3 Boulevard Pasteur, Paris 15, Francia).

H. H. Nielsen es le presidente del Commission super Symbolos, Unitates, e Nomenclatura e J. de Boer (Finsenstraat 28, Amsterdam, Hollanda) es le secretario. Il ha septe altere commissiones specialisate.

Le UIPPA es representate in le Commission Juncte de Spectroscopia e altere commissiones juncte. ♁

-•-

D. E. MANN del statounitese Bureau National de Standards passa le anno currente in le departimento de physica al Universitate Roma in Italia con subventiones Fulbright e Guggenheim.

• MARTIO 3-7. None conferentia Pittsburgh super le chimia analytic e le spectroscopia applicate. Penn-Sheraton Hotel. (R. K. Scott, Harbison-Walker Refractories Co., Hays Laboratory, Pittsburgh 7, Pa.,S.U.A.)

• MARTIO 6, Assemblea del Societate Coblentz al conferentia Pittsburgh, a 20 horas (8 P.M.). (V. Z. Williams, Corporation Perkin-Elmer, Norwalk, Conn., S.U.A.)

• MARTIO 13-14. Colloquio super le spectroscopia Raman. Stuttgart. (J. Goubeau, Laboratorio de Chimia Inorganic, Technische Hochschule, Stuttgart, Germania.)

• MARTIO. Symposio super le spectroscopia a frequentias radionic; technicas del resonantia magnetic nucleari. Oxford. (R. E. Richards, Laboratorio de Chimia Physic, Universitate Oxford, Oxford, Anglaterra.)

• APRIL 15. Societate pro le Spectroscopia Applicate, Pittsburgh. Le spectros infrarubie de moleculas adsorbite, W. A. Pliskin. (E. D. Haller, Compania Arthur H. Thomas, Cassa Postal 779, Philadelphia 5, Pa.)

• MAIO 7. Societate pro le Spectroscopia Applicate, New York. Spectroscopia con scrutinio rapide in le pyrotechnica, J. F. Tyroler. (C. A. Jedlica, Lucius Pitkin, Inc., 47 Fulton St., New York 38.)

• JUNIO 9-11. None symposio annue de spectroscopia, Association American de Spectrographos. Pick-Congress Hotel, Chicago. (H. J. Hettel, Armour Research Foundation, 10 W. 35th St., Chicago 16, Illinois, S.U.A.)

• JUNIO 16-20. Symposio super le spectroscopia molecular. Columbus, O. (H. H. Nielsen, Depto. de Physica, Univ. Ohio State, Columbus 10, Ohio.)

• JUNIO. Curso laboratorial super le spectroscopia infrarubie applicate. Instituto Polytechnic de Brooklyn, Brooklyn, New York, S.U.A.

• JUNIO 30-JULIO 8. Colloquio super atomos e moleculas ex le recerca radioelectric. (R. Freymann, Univ. Rennes, Rennes, Francia; J. G. Powles, Depto. de Physica, Collegio Queen Mary, London E.1, Anglaterra.)

• AUGUSTO 4-8. Curso in le technicas del spectroscopia infrarubie, e

• AUGUSTO 11-15. Curso in le applicationes del spectroscopia infrarubie. Cambridge, Mass. (J. M. Austin, Instituto Technologic de Massachusetts, Cambridge 39, Mass., S.U.A.)

• AUGUSTO 13-20. Assemblea general del Union International de Astronomia e le assemblea 1958 del Commission Juncte de Spectroscopia, Moscova. Vide p. 4. (P. F. A. Klinkenberg, Laboratorio Zeeman, Muidergracht 4, Amsterdam-C, Hollanda.)

• AUGUSTO 25-29. None instituto annue de spectroscopia infrarubie del Universitate Fisk, Nashville. (N. Fuson, Depto. de Physica, Univ. Fisk, Nashville 8, Tennessee, S.U.A.)

• SEPTEMBRE 15-17. Quinte symposio Ottawa del Association Canadian de Spectroscopia Applicate. Summarios de discursos debe esser submittite non plus tarde que le 2 de junio. (N. Tomingas, Canadian Copper Refiners, Cassa Postal 338, Place d'Armes, Montreal, Quebec.)

• SEPTEMBRE 28-OCTOBRE 2. Septime colloquio international de spectroscopia. Liege, Belgica. (Association de Ingenieros del Univ. Liege, 22 rue Forgeur, Liege, Belgica.)

• OCTOBRE. Quinte symposio super le spectroscopia Raman e infrarubie. Universitate Kyoto, Japon. (Y. Morino, Depto. de Chimia, Universitate Tokio, Tokio, Japon.)

• OCTOBRE. Symposio super le chimia structural. Univ. Osaka, Japon. (Y. Morino, supra-date adresse.)

-•-

COMO pote iste periodico meliorar se?

Nuclear Quadrupole Resonance Spectroscopy

SUPPLEMENT 1 TO SOLID STATE PHYSICS

By **T. P. DAS,** *Department of Chemistry, Cornell University, Ithaca, New York*
and **E. L. HAHN,** *Department of Physics, University of California, Berkeley, California*

February 1958, about 200 pp., illus., approx. $6.00

CONTENTS:

Part I. Theory

Frequencies and Intensities of Quadrupole Resonance Spectra and their Zeeman Effect. Static Causes for Splitting and Broadening of Quadrupole Spectra. Effects of Internal Motions in Molecular Solids on Nuclear Quadrupole Resonance. Theory of Transient Experiments in Quadrupole Resonance.

Part II. Instrumentation

Part III. Applications of Interest to the Solid State

Information on the Constitution of the Crystalline Unit Cell. Interpretation of Nuclear Quadrupole Coupling Data in Terms of Electron Distribution in Chemical Bonds within Free Molecules. Information on Intermolecular Binding in the Solid State. Quadrupole Resonance Studies of Nuclei Other than Halogens. Results on Broadening due to Defects.

AUTHOR INDEX—SUBJECT INDEX.

---------- ORDER FORM ----------

ACADEMIC PRESS INC.
111 Fifth Avenue, New York 3, New York

Please enter the following order:

SOLID STATE PHYSICS: Advances in Research and Applications

___*standing order, starting with **Vol.** ___
___ **Vol. 4,** $12.00
___ **Vol. 5,** $11.00
___ **Nuclear Quadrupole Resonance Spectroscopy,** by Das and Hahn, approx. $6.00†

**FOR YOUR CONVENIENCE we suggest the placing of a STANDING ORDER for serial publications so that you will automatically receive a copy of every new volume upon publication. Your standing order will remain on file until cancelled.*

†Supplements are not included in standing order.

Date_____

Name *(please sign)*_____

Name (PLEASE PRINT)_____

Institution_____

Address_____

City_____

Postal Zone_____State_____

Please add 3% Sales Tax for New York City deliveries.

☐ Remittance enclosed ☐ Please bill

F329-5711

Printed in U.S.A.

Solid State Physics

Advances in Research and Applications

Edited by **FREDERICK SEITZ,** *University of Illinois, Urbana, Illinois*

and **DAVID TURNBULL,** *General Electric Research Laboratory, Schenectady, New York*

Volume 4

August 1957, 540 pp., illus., $12.00

CONTENTS:

Ferroelectrics and Antiferroelectrics
By WERNER KÄNZIG, General Electric Research Laboratory, Schenectady, New York

Theory of Mobility of Electrons in Solids
By FRANK J. BLATT, Michigan State University, East Lansing, Michigan

The Orthogonalized Plane-Wave Method
By TRUMAN O. WOODRUFF, General Electric Research Laboratory, Schenectady, New York

Bibliography of Atomic Wave Functions
By ROBERT S. KNOX, University of Rochester, Rochester, New York

Techniques of Zone Melting with Crystal Growing
By W. G. PFANN, Bell Telephone Laboratories, Murray Hill, New Jersey

AUTHOR INDEX—SUBJECT INDEX.

Volume 5

December 1957, 455 pp., illus., $11.00

CONTENTS:

Galvanomagnetic and Thermomagnetic Effects in Metals
By J.-P. JAN, Laboratoire Suisse de Recherches Horlogères, Neuchâtel, Switzerland

Luminescence in Solids
By CLIFFORD C. KLICK and JAMES H. SCHULMAN, United States Naval Research Laboratory, Washington, D. C.

Space Groups and Their Representations
By G. F. KOSTER, Massachusetts Institute of Technology, Cambridge, Massachusetts

Shallow Impurity States in Silicon and Germanium
By W. KOHN, Carnegie Institute of Technology, Pittsburgh, Pennsylvania

Quadrupole Effects in Nuclear Magnetic Resonance Studies of Solids
By M. H. COHEN and F. REIF, University of Chicago, Chicago, Illinois

AUTHOR INDEX—SUBJECT INDEX.

Volume 6 *Spring 1958, in preparation*

PREVIOUSLY PUBLISHED:

VOLUME 1, 1955, 469 pp., illus., $10.00

"Throughout the entire book the style is critical, and limitations and approximations are carefully stated. An excellent beginning has been made for a series which promises to be of great value to solid-state physicists, chemists, and metallurgists."—Physics Today

VOLUME 2, 1956, 468 pp., illus., $10.00

"The presentation of the material in the present volume is uniformly excellent. It is quite evident that this series will be indispensable to any student or investigator interested in the physics of the solid state." —Journal of the Franklin Institute

VOLUME 3, 1956, 588 pp., illus., $12.00

"The most recent volume of the 'Seitz-schrift'—as this publication is affectionately referred to in most of Europe—entirely lives up to the standard set by the first two volumes." —Physics Today

Academic Press Inc., Publishers
111 FIFTH AVENUE, NEW YORK 3, NEW YORK

British Office: Academic Books Ltd., 129 Queensway, London W. 2
German Agency: Minerva, G.m.b.H., Holbeinstr. 25-27, Frankfurt am Main
Indian Agency: Asia Publishing House, Nicol Road, Ballard Estate, Bombay 1

W.L. Wavelength
T. Transmission
H.W. Half Width

The following filters are available in quantities of 1 or 2, on a first-come, first-served basis. Price per filter is $20.00.
Bausch & Lomb Optical Co., Rochester 2, N. Y.

1ST ORDER FILTERS

W.L.	T.	H.W.	W.L.	T.	H.W.	W.L.	T.	H.W.	W.L.	T.	H.W.
458	34	15	517	39	17	523	47	20	535	38	19
459	34	14	517	39	19	524	36	17	536	42	20
460	34	15	517	40	18	524	37	16	537	40	20
460	34	16	517	40	17	524	37	17	537	40	22
461	32	15	517	43	19	524	38	17	537	41	20
461	34	15	517	43	20	524	38	19	538	32	15
461	35	15	517	43	21	524	39	14	538	37	20
473	46	23	517	44	17	524	40	18	538	38	18
474	44	23	517	44	19	524	41	17	538	39	17
474	45	21	517	44	20	524	41	18	538	40	21
474	45	22	517	45	21	524	42	18	538	41	20
474	46	22	518	37	17	524	42	19	538	42	20
475	42	23	518	38	18	525	36	17	528	42	23
475	43	20	518	39	17	525	37	16	539	38	21
475	43	22	518	40	16	525	37	17	539	40	19
475	43	23	518	40	18	525	39	17	539	40	20
475	44	21	518	41	18	525	40	18	539	41	19
475	46	22	518	41	19	525	41	17	541	37	22
477	40	18	518	43	18	525	46	18	541	39	21
477	41	17	518	43	20	514	46	23	534	48	20
477	41	18	518	44	19	526	40	16	536	46	20
478	39	17	518	44	20	526	40	17	566	33	16
478	40	17	518	44	21	526	40	18	566	33	17
478	41	17	518	45	20	526	42	17	566	35	16
478	40	18	519	35	16	526	47	18	567	33	17
478	41	18	519	36	17	527	40	17	567	34	17
478	42	17	519	36	18	528	40	21	568	33	16
479	40	16	519	37	16	529	38	17	569	34	13
479	41	17	519	37	17	531	34	18	569	35	15
480	38	17	519	39	16	531	38	15	575	38	9
480	39	17	519	40	18	531	39	16	579	36	10
481	38	16	519	44	19	531	39	19	579	43	12
481	39	16	519	44	20	531	40	17	580	35	10
481	39	17	519	44	21	531	41	20	580	39	12
482	38	16	519	45	20	531	43	18	581	40	12
482	38	17	520	36	17	531	43	19	581	41	11
482	39	16	520	37	16	532	40	17	581	42	11
483	37	17	520	37	18	532	40	19	582	40	11
488	49	20	520	38	16	532	40	20	582	43	10
489	47	20	520	38	17	532	41	18	585	39	10
489	49	21	520	43	21	532	42	17	586	48	22
489	50	20	521	40	18	532	44	11	586	48	23
493	41	15	521	40	19	533	32	15	591	27	14
494	46	24	521	42	18	533	35	17	591	45	20
495	40	15	521	43	19	533	37	15	591	48	21
497	47	25	521	43	20	533	38	16	591	48	23
498	44	21	521	43	21	533	39	16	591	49	23
498	44	25	522	35	17	533	40	16	591	49	24
498	45	24	522	39	17	533	40	17	592	27	13
499	41	21	522	39	18	533	40	19	592	27	14
499	43	25	522	40	18	533	43	17	592	28	13
500	44	24	522	40	19	533	46	20	592	48	21
503	46	24	522	41	18	534	30	19	592	50	23
504	42	20	522	42	17	534	32	15	593	27	14
504	43	21	522	42	18	534	32	16	593	28	13
504	43	24	523	36	19	534	33	15	593	28	14
504	44	23	523	37	17	534	36	18	593	29	13
504	48	18	523	39	18	534	37	20	593	30	14
505	44	22	523	40	17	534	40	18	593	39	10
506	48	16	523	41	17	534	42	18	593	47	21
516	43	19	523	41	18	534	48	20	593	48	23
516	43	20	523	40	18	535	32	15	594	28	14
516	44	20	523	42	17	535	32	16	594	27	14
517	45	20	523	43	21	535	36	16	594	28	14
517	38	17	523	46	19	535	37	19	595	27	14

1ST ORDER FILTERS (Cont'd)

W.L.	T.	H.W.	W.L.	T.	H.W.	W.L.	T.	H.W.	W.L.	T.	H.W.
598	46	20	622	34	18	631	45	20	635	44	18
597	47	21	623	32	16	633	33	16	635	45	16
597	48	20	623	33	18	633	35	17	636	41	17
604	14		623	34	18	633	35	18	636	41	18
608	41	19	623	42	19	633	35	19	636	43	20
609	41	18	623	46	21	633	36	17	638	40	20
613	43	18	626	43	21	633	36	18	638	43	19
613	44	18	627	43	20	633	37	17	638	44	19
615	42	18	627	45	21	633	42	18	639	41	15
615	45	22	628	43	20	633	42	20	644	42	18
616	39	17	628	44	19	633	44	19	646	40	17
616	41	17	628	45	19	634	35	17	646	44	19
616	41	18	628	45	21	634	38	20	647	37	17
617	39	17	629	45	21	634	44	19	648	40	17
620	34	17	630	36	19	634	45	19	492	48	25
620	34	18	631	37	20	635	43	20	492	49	25
620	34	19	631	42	18	635	44	19	494	49	25
621	35	18	631	44	19	635	44	21			

2ND ORDER FILTERS

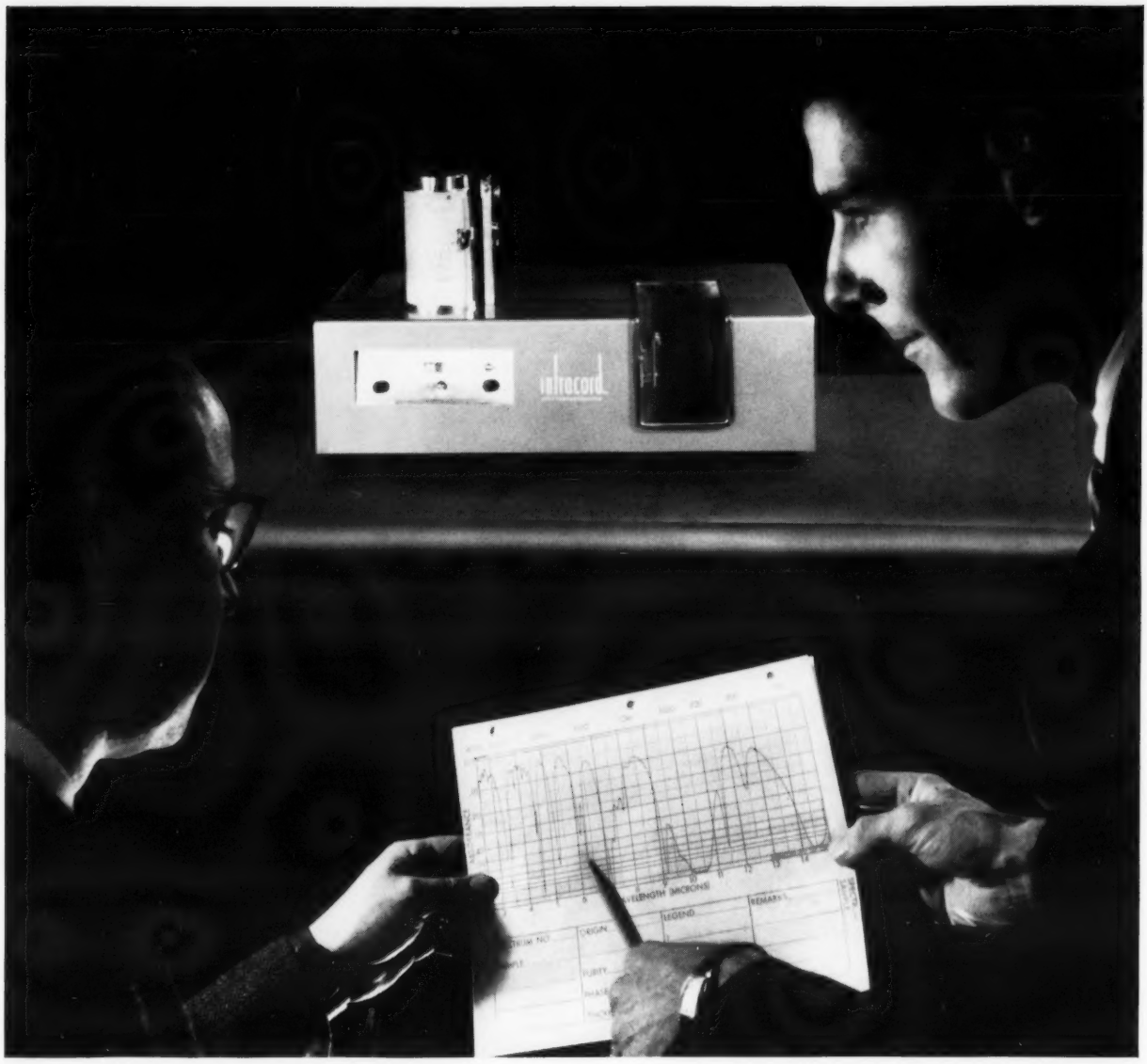
331	30	20	429	41	11	513	34	7	535	46	10
332	30	20	430	40	10	513	33	7	538	42	9
333	30	20	431	47	11	513	39	9	539	40	10
384	25	12	432	33	12	513	40	9	527	37	9
396	28	10	440	45	11	513	44	9	527	40	9
395	51	17	441	40	10	513	52	10	528	39	9
388	34	11	442	40	10	514	33	15	528	40	8
389	32	10	443	47	11	514	35	8	528	40	9
392	38	15	444	40	11	514	40	8	530	35	8
407	39	13	444	46	11	514	43	9	530	42	8
408	43	11	448	32	7	514	49	8	530	43	9
409	37	13	449	32	7	515	33	14	525	50	13
410	38	13	468	40	9	515	35	15	525	51	13
410	32	8	469	32	7	515	37	9	528	50	13
411	38	13	470	44	9	515	39	9	528	51	12
411	35	11	471	38	10	508	47	12	528	51	13
411	28	9	472	40	8	509	47	12	529	52	13
412	34	9	475	45	10	510	47	12	529	51	13
413	37	10	475	36	8	511	47	11	529	51	12
414	35	12	478	36	8	512	41	9	528	35	8
415	32	10	479	35	9	513	40	9	531	43	9
415	29	9	480	46	11	514	40	9	532	41	8
415	30	19	481	35	8	515	38	8	532	43	9
415	31	9	482	32	8	516	34	13	532	44	10
415	33	9	483	32	9	517	29	9	532	45	10
415	36	10	484	37	8	517	32	15	532	46	10
416	36	9	490	32	9	517	33	14	534	27	10
417	27	8	491	32	7	517	34	15	534	39	7
418	29	8	492	34	7	517	36	14	534	48	9
419	28	8	493	41	10	517	36	9	535	43	9
414	38	10	494	37	10	518	33	14	530	51	12
415	39	11	495	37	10	518	37	10	532	35	14
415	38	11	496	36	7	519	33	14	533	46	15
415	36	9	500	37	10	519	33	15	534	35	12
417	35	9	502	36	9	519	35	14	534	46	16
421	32	10	503	43	10	510	34	7	534	46	14
423	27	9	504	43	10	510	41	10	534	45	16
424	32	10	505	35	8	510	50	14	535	35	13
427	28	8	503	35	14	510	51	14	535	46	14
469	41	10	506	43	9	510	52	14	535	46	15
470	40	10	508	42	9	510	52	13	535	46	16
478	40	7	508	42	10	511	42	9	535	45	15
479	38	7	508	42	11	512	42	9	535	37	16
480	39	12	509	41	10	520	37	8	535	47	15
485	48	10	509	52	13	522	40	9	535	47	16
423	40	10	509	53	12	525	39	9	537	36	13
424	40	9	509	53	14	533	47	11	536	37	16
428	36	10	509	52	14	534	45	12	537	37	17

2ND ORDER FILTERS (Cont'd)

W.L.	T.	H.W.	W.L.	T.	H.W.	W.L.	T.	H.W.	W.L.	T.	H.W.
537	38	15	555	30	8	632	38	10	688	40	10
537	49	14	555	31	8	633	38	10	691	31	8
537	50	13	555	32	8	634	37	10	691	39	10
538	37	16	555	34	8	635	40	10	692	35	8
538	38	16	555	34	9	639	32	10	693	29	9
538	47	14	555	36	8	638	38	10	693	29	10
539	47	14	555	37	8	639	38	9	695	29	9
539	46	15	555	40	10	640	37	10	695	41	10
539	37	16	556	31	8	641	37	10	696	35	9
539	43	12	556	32	7	642	38	11	698	29	9
539	47	14	556	35	8	643	37	10	694	40	11
539	50	12	556	39	9	654	33	10	704	38	11
540	37	16	557	30	8	659	33	9	704	39	11
540	38	15	557	33	7	660	33	9	705	32	9
540	46	14	557	39	8	661	34	10	714	32	8
540	47	14	558	49	12	662	32	9	715	32	8
549	40	10	559	48	12	672	32	8	715	32	10
550	40	10	559	49	12	673	32	8	716	33	10
551	40	10	560	40	10	674	32	8	716	34	9
552	38	8	560	43	10	675	32	8	717	32	8
553	38	9	560	47	13	688	39	11	717	32	9
554	43	10	562	33	7	689	33	9	717	32	10
555	39	9	563	40	10	693	42	10	717	33	10
558	42	10	564	37	9	694	43	10	717	34	10
559	42	10	565	35	9	695	42	10	717	35	9
560	37	9	565	37	9	697	41	11	717	40	10
561	36	9	566	40	10	698	43	10	718	32	8
562	35	9	567	27	8	699	41	11	719	32	9
563	45	10	568	32	8	606	38	12	719	38	11
564	44	10	569	28	8	608	36	10	720	32	10
565	34	9	564	38	10	607	42	12	720	32	9
568	43	10	565	38	9	617	29	8	720	39	9
573	41	10	566	36	10	621	26	7	711	37	10
565	40	10	567	38	10	632	32	9	721	37	9
568	43	10	561	39	10	635	33	11	724	33	9
569	42	9	562	41	10	635	39	10	724	34	9
570	42	10	564	47	12	635	35	9	726	36	10
571	42	10	565	46	12	637	39	10	727	36	10
572	42	10	565	47	13	637	40	10	728	37	9
573	40	10	570	37	10	637	34	10	728	38	11
574	41	10	571	38	9	638	38	9	728	39	10
575	40	10	572	42	12	638	39	9	729	35	10
581	45	10	573	41	12	638	40	10	729	36	10
582	39	9	574	41	12	642	35	9	729	38	9
583	37	9	575	39	10	643	36	9	720	31	9
585	32	9	575	39	12	643	36	10	720	39	11
591	36	9	575	40	12	645	36	10	724	32	10
592	41	10	575	42	10	645	37	9	727	36	12
593	42	11	588	48	21	647	35	10	728	42	12
594	41	10	594	34	8	648	41	9	730	32	9
595	42	10	595	29	7	649	34	9	731	29	8
592	41	10	591	50	22	665	32	9	731	36	10
598	40	11	608	35	8	665	34	9	731	37	10
599	41	10	609	41	10	666	34	9	731	41	11
540	49	12	610	34	9	666	36	9	732	27	8
540	50	12	612	34	8	667	35	8	735	37	10
540	50	13	613	40	8	668	34	9	736	32	8
541	37	16	614	35	8	677	32	9	736	35	9
541	38	15	615	33	9	683	30	9	737	36	9
541	38	16	618	38	9	685	29	9	737	37	10
541	47	15	619	35	9	685	30	9	732	35	9
541	49	12	620	34	8	685	34	8	731	32	8
541	50	13	621	34	8	687	30	8	734	32	8
542	50	13	622	33	8	687	34	9	734	34	9
545	50	12	623	35	9	687	35	8	735	32	9
553	38	9	624	37	9	687	41	10	738	32	10
554	34	8	625	36	8	688	30	8	740	32	9
554	35	9	629	38	10	688	40	8	741	32	9
554	37	9	630	37	10	689	30	9	747	32	8
554	39	8	631	38	10	690	31	8	746	33	9

2ND ORDER FILTERS (Cont'd)

W.L.	T.	H.W.
747	35	8
749	33	8
749	42	12
750	39	7
752	40	11
752	42	11
753	31	8
754	30	9
755	31	8
756	30	7
756	42	11
757	32	7
757	30	8
758	31	8
759	31	8
759	33	9
753	45	14
766	31	9
768	37	12
761	45	13
762	43	14
775	30	9
775	48	18
776	36	13
776	38	10
777	38	10
778	37	10
778	47	16
778	48	16
778	48	17
778	48	18
779	46	17
779	48	17
779	48	18
780	47	18
772	43	15
773	43	16
779	32	9
782	16	8
782	36	11
783	34	10
783	36	12
783	37	12
784	33	10
784	37	12
786	43	13
790	34	10
783	37	12
788	38	11
788	40	11
788	40	14
788	41	14
789	41	14
789	41	15
790	37	11
790	38	11
790	41	14
791	33	11
792	32	8
792	32	10
792	37	10
793	37	11
791	41	14
792	37	12
793	35	11
700	42	11
701	33	10
702	42	11
703	41	11
704	42	11
705	41	11
710	35	10
711	34	10
712	35	9
713	34	10
715	38	9
718	40	11
719	40	11
720	40	11
721	40	10
722	35	10
723	36	10
724	35	10
725	35	10
727	35	9
735	35	9
728	32	10
729	34	10
730	33	10
731	35	10
732	36	10
733	36	10
734	30	9
735	32	9
738	33	9
739	33	9
740	32	10
741	32	9
742	35	10
743	40	10
744	40	10
745	41	10
748	44	14
749	32	8
754	32	8
769	35	10
770	32	10
771	35	11
772	35	11
773	35	11
774	33	11
775	32	11
779	35	11
778	34	11
779	32	9
780	37	10
781	37	11
782	38	11
783	32	8
784	32	8
785	35	12
788	39	11
789	38	11
790	35	11
791	37	12
792	40	14
793	35	10
794	32	11
795	32	10
799	37	12
800	32	10
801	32	11
802	32	11
803	32	10
804	32	10
805	35	12
811	36	10
818	34	12
819	35	12
819	35	13
811	32	10
811	35	10
811	36	10
811	36	11
811	37	10
812	32	9
812	32	10
812	33	11
812	36	10
812	36	11
813	32	9
813	32	10
813	45	14
820	37	9
820	38	12
818	31	12
822	43	13
822	43	14
822	33	12
822	34	10
823	32	11
823	34	10
823	36	9
823	36	11
823	39	13
823	40	12
823	42	12
823	43	13
824	30	12
824	31	12
824	33	11
824	33	12
824	34	11
824	35	10
824	35	11
824	40	12
824	43	13
824	43	14
824	44	13
825	31	11
825	32	10
825	32	12
825	33	11
825	34	10
825	34	11
825	34	12
825	35	10
825	35	11
825	35	12
825	39	12
825	40	13
826	32	12
827	30	10
828	32	10
828	33	10
828	34	10
828	35	9
828	36	11
828	40	12
828	40	13
828	41	12
829	36	11
829	35	10
829	37	12
829	40	12
830	36	10
830	37	12
830	40	12
830	40	13
829	34	10
822	37	10
822	37	11
823	36	10
824	36	10
825	36	11
826	34	11
826	35	10
826	36	9
826	36	10
826	36	11
827	35	9
827	36	9
827	36	10
827	36	10
828	36	9
829	36	10
831	35	12
831	35	13
831	36	10
831	36	11
831	37	12
831	40	12
831	40	13
831	31	10
832	36	11
832	36	12
832	40	12
832	40	13
833	35	12
834	35	12
834	35	13
835	36	11
835	42	14
837	38	10
838	36	10
838	37	11
838	41	13
838	43	13
839	41	13
840	33	18
841	35	11
841	42	12
844	36	10
314	34	9
365	25	22
367	27	22
384	42	17
385	41	16
386	39	13
405	44	11
406	44	11
407	44	10
433	42	10
434	41	10
435	41	10
576	41	10
577	37	10
579	38	10
580	37	10
581	36	9
623	35	8.5
642	32	9
643	32	9
644	36	10
645	35	10
646	35	10
516	33	14
511	52	13
788	42	14
578	38	10



"The Model 137 proves it, Jim—pure acrylonitrile"

Manufacturers of synthetics, and others whose processes depend on purity for satisfactory polymerization, are relying more and more on rapid, accurate control analyses made right at the bench with the low-cost Perkin-Elmer Model 137. For example:

The end point in the manufacture of acrylonitrile by distillation is marked by the complete removal of water from ethylene cyanohydrin. With the Model 137 INFRACORD* Spectrophotometer checking the reaction, guesswork and the possibility of error are minimized. The well-resolved INFRACORD spectrum of acrylonitrile shown above demonstrates that the reaction is complete—the acrylonitrile must be pure—since no characteristic OH band is present at 2.8 microns. Best of all, this infrared spectrum was obtained automatically in twelve minutes—and spot analysis of the critical OH region can be made in *seconds!*

The INFRACORD, product of a four-year development program by Perkin-Elmer, embodies the latest advances in optical, electronic and mechanical design. Its double beam optical null system, previously available in only the most expensive instruments, provides the speed, energy, short path length and resolution essential for good qualitative and quantitative analysis.

Yet, with all its features, the INFRACORD instrument is moderately priced and simple to operate. Many companies are making it an everyday tool for the bench chemist. Spectroscopists use it for routine work, thus free ultra-precision instruments for research and similar work.

For complete information, write Perkin-Elmer at 779 Main Avenue, Norwalk, Conn.

*T.M.

INSTRUMENT DIVISION

Perkin-Elmer *Corporation*

NORWALK, CONNECTICUT